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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/838,377	04/19/2001	Steven Edward Atkin	AUS920010277US1	9249
45993	7590	10/21/2004	EXAMINER	
IBM CORPORATION (RHF)			FOWLKES, ANDRE R	
C/O ROBERT H. FRANTZ			ART UNIT	PAPER NUMBER
P. O. BOX 23324				2122
OKLAHOMA CITY, OK 73123				

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/838,377	ATKIN, STEVEN EDWARD	
	Examiner Andre R. Fowlkes	Art Unit 2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 April 2001.
 2a) This action is FINAL. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-30 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-30 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 19 April 2001 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)	4) <input type="checkbox"/> Interview Summary (PTO-413)
2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)	Paper No(s)/Mail Date. _____
3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____	5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)
	6) <input type="checkbox"/> Other: _____

DETAILED ACTION

1. Claims 1-30 are pending.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davis, "The Bi-directional Algorithm", Unicode Technical Report #9, Revision 6, in view of Hutton, "FAQ for comp.lang.functional" newsgroup publication.

As per claim 1, Davis discloses **a method of converting a logically ordered character stream into a character stream suitable for display by a computer and comprehension by a user** (p. 3:12-13, "This section describes the algorithm used to determine the directionality for bidirectional Unicode text"),

- said logically ordered character stream having a plurality of characters and control codes contained within it (p. 3:30-31, "The display ordering of bidirectional text depends upon the directional properties (i.e. control codes) of the characters in the text"),

said method comprising:

- assigning bi-directional attributes to the logical character stream (p. 3:13-14, "The algorithm ... adds explicit format codes (i.e. bi-directional attributes)'),

- assigning initial level numbers and honoring any directional overrides by explicit processing (p. 7:4-5, "*Embedding levels* (i.e. *initial level numbers*) are numbers that indicate how deeply the text is nested, and the default direction of text on that level", and p. 4:29-32, "Explicit Directional Overrides... allow the bidirectional character types to be overridden when required for special cases"),

- changing attribute types based upon surrounding attribute types through weak and neutral processing (p. 11:7-11, "The body of the bidirectional algorithm uses character types and explicit codes to produce a list of resolved levels (i.e. the attribute types are changed based on surrounding attribute types). This resolution process consists of five steps: (1) determining the paragraph level; (2) determining explicit embedding levels and directions; (3) resolving weak types (i.e. weak processing); (4) resolving neutral types (i.e. neutral processing); and (5) resolving implicit embedding levels"),

- associating final level numbers to the logical character stream through implicit processing (p. 17:9-11, "Resolving Implicit Levels: In the final phase, the embedding level of text may be (changed using implicit processing)'),

- reordering said characters within said logical character stream according to said final level numbers such that said reordered characters form a character

stream in display order (p. 17:35-18:1, “Reordering Resolved Levels: The following algorithm describes the logical process of finding the correct display order”).

Davis doesn’t explicitly disclose performing/implementing the algorithm of claim 1 using a **functional programming language**.

However, Hutton, in an analogous environment, discloses implementing algorithms using a **functional programming language** (p. 3:20, Hutton gives an example of how an algorithm implemented in an imperative language can be written in a functional programming language, as well, “In a functional language, the same program would be expressed (in the following fashion)”),

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to incorporate the teachings of Hutton into the system of Davis to perform/implement the algorithm in a **functional programming language**. The modification would have been obvious because one of ordinary skill in the art would have wanted to exploit the numerous advantages of using functional programming (e.g. algorithms written using functional programming languages are well-structured software that is easy to write, easy to debug, and provides a collection of modules that can be re-used to reduce future programming costs).

As per claim 2, the rejection of claim 1 is incorporated and further, Davis discloses that **said step of assigning bidirectional attributes further comprises obtaining said bidirectional attributes from a character database** (p. 8:31-32, “The

normative bidirectional character types for each character are specified in the Unicode Character Database").

As per claim 3, the rejection of claim 1 is incorporated and further, Davis discloses that **the step of grouping characters into sequential runs using type constructors and level such that characters are processed collectively rather than individually** (p.3:20-23, "a minimal set of directional formatting codes is defined to control the ordering of characters when rendered. This allows exact control of the display ordering for legible interchange and also ensures that plain text used for simple items like filenames or labels can always be (grouped into sequential runs and) correctly ordered for display").

As per claim 4, the rejection of claim 1 is incorporated and further, Davis discloses that said step of changing attribute types based upon surrounding attribute types through weak and neutral processing in a functional programming language comprises **providing blocks of programming language (code) indexed by name weak type processing, neutral type processing, and implicit level processing such that said method may be readily used as a reference** (The examiner is interpreting this limitation to mean that the algorithm is implemented using object oriented techniques of creating software blocks/objects and code reuse. Davis discloses the use of object oriented programming concepts at p. 2:17-18, "One version (of the bidirectional algorithm) is written in Java, while the other is written in C++").

As per claims 5-10, the rejection of claim 1 is incorporated and further, Davis doesn't explicitly disclose that the algorithm is implemented **in the Haskell, Erlang, SML, Miranda, Lisp or Scheme functional languages.**

However, Hutton, in an analogous environment, discloses an algorithm is implemented **in the Haskell, Erlang, SML, Miranda, Lisp or Scheme functional languages** (p. 1:9-25, "Erlang ... Haskell ... Miranda ... (S)ML Scheme" and p. 30:22, "Lisp").

Therefore, it would have been obvious to a person of ordinary skill in the art, at the time the invention was made, to incorporate the teachings of Hutton into the system of Davis to have the algorithm implemented **in the Haskell, Erlang, SML, Miranda, Lisp or Scheme functional languages.** The modification would have been obvious because one of ordinary skill in the art would have wanted to exploit the advantages of each of the languages in the proper situation (e.g. Haskell is advantageous as it is a "standard" non-strict, purely-functionally programming language (Hutton, p. 23:14-15), Erlang is advantageous in situations involving large real-time systems (p. 21:19-20), SML is advantageous as it is an advanced programming language with functional control structures, strict semantics, a strict polymorphic type system, and parameterized modules (p. 26:22-25), Miranda is advantageous as it is the first widely disseminated language with non-strict semantics and polymorphic strong typing (p. 25:18-20), Lisp is a powerful programming language with relatively simple syntax, Scheme is

advantageous as it is a dialect of Lisp that stresses conceptual elegance that is able to simply represent many programming abstractions (p. 30:20-28)).

Claims 11-20, are directed to a computer readable medium version of the claimed method discussed above, in claims 1-10, wherein all claimed limitations have also been addressed and/or cited as set forth above. For example, see Davis's Bidirectional algorithm (p. 2:14-25).

Claims 21-30, are directed to a text code conversion system version of the claimed method discussed above, in claims 1-10, wherein all claimed limitations have also been addressed and/or cited as set forth above. For example, see Davis's Bidirectional algorithm (p. 1:1-2:25).

Conclusion

4. After October 25, 2004, the examiner can be reached at new telephone number (571) 272-3697, and the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre R. Fowlkes whose telephone number is (703)305-8889. The examiner can normally be reached on Monday - Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (703)305-4552. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ARF

Chameli C. Das
CHAMELI C. DAS
PRIMARY EXAMINER

10/18/04